

Atty. Docket No. Q62891
PATENT APPLICATION

AMENDMENT UNDER 37 C.F.R. § 1.114(c)
U.S. Application No. 09/774,877

AMENDMENTS TO THE SPECIFICATION

Please replace the paragraph bridging pages 4 and 5 with the following:

The expression "display protocol" refers to the protocol which defines image layout, image display conditions, image processing conditions, etc., based on an examination, a series, the examining doctor or group of doctors, the place an image will be used and/or the purpose of the image, etc. More specifically, a definition by which a screen is divided into four regions in which are displayed a front view X-ray image of the chest taken during the current examination in the upper left region, a front view X-ray image of the chest taken in the past in the lower left region, a side view X-ray image of the chest taken during the current examination in the upper right region, and a side view X-ray image of the chest taken in the past in the lower upper right region, or alternatively, a definition by which a screen is divided into 9 regions in which a plurality of Tomography images obtained by a CT apparatus are lined up and displayed, or a definition by which projection images and cross-sectional images obtained by a CT apparatus are lined up and displayed, or a definition by which cross-sectional images obtained by a CT apparatus are able to be switched and displayed, or a definition by which for images T1 and T2 obtained by an MRI apparatus in a special examination mode, a display screen may be divided up and images displayed based on whether or not a contrast medium was used when an image was taken, etc., may be employed as display protocols.

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Please replace the final paragraph on page 6 with the following:

C2 ~~That Furthermore, it is desirable that the aforementioned control means, displays, based on the display protocol sequence selected in the input means, displays on the display means the plurality of images is desirable on the display means.~~

Please replace the third full paragraph on page 8 with the following:

C3 Figure [[3]] 3A shows examples of display protocols,

Please insert the following after the third full paragraph on page 8:

C4 Figure 3B shows further examples of display protocols.

Figure 3C shows yet additional examples of display protocols.

Please replace the paragraph bridging pages 8 and 9 with the following:

C5 Figure 1 is a block drawing of the configuration of a medical image network, in which the display apparatus according to a preferred embodiment of the present invention is implemented. As shown in Fig. 1, this medical image network comprises an image server 1 storing image data S and a workstation 2 connected by a network 3. ~~In such a medical image network, by workstation 2 accessing image server 1 and specifying that image data stored in image server 1 be transmitted, or by workstation 2 reading out from image server 1 image data stored from workstation to image server 1, images can be displayed at workstation 2 and diagnosis performed. In such a medical image network, workstation 2 accesses image server 1 so as to request server 1 to transmit image data stored in image server 1, or workstation 2 directly reads out image data stored in image server 1, so that images can be displayed at workstation 2~~

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C5
and diagnosis can be performed. Note that in Fig. 1, although only one workstation is shown, multiple workstation 2's are connected to image server 1 by network 3.

Please replace the paragraph bridging pages 9 and 10 with the following:

C6
Note that, according to the set conditions (after a predetermined period of time elapses after diagnosis by a doctor has been performed, for example), image data S is copied from temporary storage medium 11 to archive 12. For example, when said set conditions are satisfied, the exact same image data S as that stored in temporary storage medium 11 is copied to archive 12, and as the amount of storage space on temporary storage medium 11 becomes unavailable for use, said image data S is deleted from temporary storage medium 11 in the order commencing from the oldest date thereof, whereby said image data S becomes stored exclusively in archive 12. Note that according to the purpose of image data S, it may be compressed and stored in both temporary storage medium 11 and archive 12. In addition, original image data or original image data that has been compressed and is extractable can be stored in temporary storage medium 11, and when said image data is copied to archive 12 it can be made uncompressible compressed non-reversibly.

Please replace the paragraph bridging pages 10 and 11 with the following:

C7
Next, the image display method for displaying images on monitor 22 of workstation 2 will be explained. Figure 2 is a block diagram showing the detailed configuration of a workstation. As shown in Fig. 2, workstation 2 is provided with a controller 27 and a memory [[28]] 26. Note that in the current embodiment of the two monitors, 22A and 22B are used for displaying images. In addition, controller 27 and memory [[28]] 26 are provided in Fig. 2 for explanation purposes, however[[;]], actual processing is carried out by use of software installed

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C7 in computer 21. In memory [[28]] 26, multiple display protocol sequences PS, in which multiple display protocols P defining multiple display layouts are lined up in a predetermined order, are remembered.

Please replace the paragraph bridging pages 11 and 12 with the following:

C8 Figs. 3A-C show Fig. 3 shows the display layouts according to each type of display protocol. Note that in the current embodiment, images obtained by a CT apparatus are displayed. More specifically, in a CT apparatus, two images are taken of the same position: one of the images has shadowed structures, and the other image does not. Generally, there is a set of projection images (called "scout views") composed of a projection image having shadowing and a projection image not having shadowing, and a set of cross-sectional images composed of a cross-sectional image having shadowing and a cross-sectional image not having shadowing, for a total of two sets of images. Each of the two sets of images obtained in this way are grouped so that there is a group containing an image S1 (projection image with shadowing), and an image S2 (cross-sectional image with shadowing), and a group containing an image S3 (projection image without shadowing), and an image S4 (cross-sectional image without shadowing). Here, there is only one image for each projection image; however, each cross-sectional image has 36 images, corresponding to the slice position, which are represented by S2 and S4. Note that images S1-S4 represent images obtained in the current examination.

Please replace the 3rd full paragraph on page 12 with the following:

C9 First, the examining doctor performs a brief examination of the images obtained in the current examination. In this case, as shown in Fig. [[3(a)]] 3A, the display screen of monitors 22A and 22B are each divided into 9 sections, and image S2 is displayed first, followed by image

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C 9
S4. Here, images S2 and S4 each have 36 cross-sectional images, however, because only 18 images can be displayed at one time on monitors 22A and 22B, according to a switching operation of input means 23, the displaying of all the images is split into two times and carried out. This type of image protocol is designated as P1.

Please replace the last full paragraph on page 12 with the following:

C 10
First, the examining doctor performs a brief examination of the images obtained in the current examination. In this case, as shown in Fig. 3A [(a)], the display screen of monitors 22A and 22B are each divided into 9 sections, and are arranged and displayed in a predetermined temporal order. For example, image S2 is displayed first, followed by image S4. Here, images S2 and S4 each have 36 cross-sectional images, however, because only 18 images can be displayed at one time on monitors 22A and 22B, according to a switching operation of input means 23, the displaying of all the images is split into two times and carried out. This type of image protocol is designated as P1.

Please replace the paragraph bridging pages 12 and 14 (to include all of page 13) with the following:

C 11
Next, for cases in which images obtained in a past examination are to be compared to images obtained in the current examination, the display screen of monitors [[2A]] 22A and 22B are each divided into four sections, as shown in Fig. 3B, and each of the images are displayed: in region A1, image S1; in region A2, image S2; in region [[S3]] A3, image O1; in region A4, image O2; in region B1, image S3; in region B2, image S4; in region B3, image O3; and in region B4, image O4. Here, images S1, S3, O1 and O3 have has only one image each, but images S2, S4, O2 and O4 each have 36 cross-sectional images, therefore, by employing input

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means 23, the images are sent in order or in reverse order, according to the number assigned to each [[image]] image (generally, the slice order, in other words, the order of the slice position), and switched and displayed. Further, a mark for showing what is called the referencing position of the cross-section is displayed in images S1, S3, [[S4]], O1, and O3 [[O4]]. In this way, it is possible to see which position of the cross-sectional positions of images [[S1]] S2, S4, [[O1]] O2 and O4 is currently being displayed. This type of display layout is called a stack display, and by displaying such a stack display it is possible to compare image S2 to image O2, and image S4 to image O4; that is to say, comparing the images obtained in the past examination to the images obtained in the current examination is easy to perform. In addition, if switching of the images of the past examination and images of the present examination is carried out at the same time, by switching only the images on one side, because the images on the other side are also sent in order, it is easy to compare the images on both sides. This type of image protocol is designated as P2.

Please replace the first full paragraph on page 14 with the following:

C 11
Next, as shown in Fig. 3C, when comparing the CT images and the chest X-ray images, the display screen of monitor 22A [[2A]] is divided into four sections, and the display screen of monitor 22B is divided into 2 sections and each image is displayed: on monitor 22A, in region A1, image S1; in region A2, image S2; in region A3, image S3; in region A4, image S4; and on monitor 22B, in region B1, the front view chest X-ray image; in region B2, the side view chest X-ray image. This type of image protocol is designated as P3.

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Please replace the second full paragraph on page 14 with the following:

C\3
Display protocol sequence PS1 is composed of aforementioned display protocols P1, P2 and P3, lined up in that order, display protocol sequence PS2 is composed of aforementioned display protocols P1, P2 and P3, lined up in the order P1, P3, P2, and display protocol sequence PS3 is composed of aforementioned display protocols P1, P2 and P3, lined up in the order P2, P1, P3. Accordingly, the display protocols are lined up for future display in a temporal fashion in that a particular display protocol is first, followed by another display protocol, which itself is additionally followed by still another display protocol.

Please replace the first full paragraph on page 15 with the following:

C\4
Then, by selecting the display protocol sequence from these types of display protocol sequences, controller 27 displays images on monitors 22A and 22B in the layout corresponding to the order of the display protocols in the selected display protocol sequence. That is, for PS1, display protocol P1 is first, followed by P2, which is then followed by P3. In other words, the display protocols are lined up and then displayed in a temporal manner.

Please replace the paragraph bridging pages 15 and 16 with the following:

C\5
Next, by pressing a function key, clicking on the screen with the mouse, etc., a check is conducted (Step S5) to determine whether or not switching of the display protocol sequence has been specified, and if a yes is registered in Step S5, a check to determine whether or not the current display protocol displaying the images is the last display protocol, P3, of the selected display protocol sequence PS1 (Step S7). If a no is registered in Step S7, layout is performed using the next display protocol in order after P1, that is P2, and the images of the next layout are displayed on monitors 22A and 22B (Step [[28]] S8), and Step S5 is returned to.

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Please replace the 2nd full paragraph on page 16, line 12 (beginning with "On the one hand") with the following:

On the one hand, if a no is registered in Step S5, a check is conducted to determine whether or not switching of the display protocol sequence has been specified (Step S6), and if a yes is registered in Step S6, the display protocol sequence is switched from the display protocol sequence selected in Step S1, PS1, to the specified display protocol sequence (PS2, for example), and Step 4 is returned to. [[;]] layout is performed using the first display protocol of the switched to display protocol sequence, and the images displayed. Note that if a no is registered in Step S6, Step S5 is returned to and Steps S5 and S6 are repeated.